

## RECENT AMERICAN INVENTIONS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week. The claims may be found in the official list.

**Hoisting Apparatus.**—This invention is based on the principle of the differential wheels, and its object is to produce a hoisting apparatus of great power in a small compass. The invention consists in the arrangement of two cog wheels with a different number of teeth; that one with the largest number of teeth being stationary and the other being secured to the axle of the drum of the hoisting apparatus or to the inner surface of said drum, in combination with two other cog wheels having the same number of teeth and attached to a tumbling shaft which is carried round the center of the drum shaft in such a manner that, by the combined action of the two wheels on the tumbling shaft and the differential wheels, a slow rotary motion is imparted to the drum shaft, and that the power applied to the tumbling shaft is multiplied in proportion to the number of teeth of the gear wheel on the drum shaft divided by the difference between the number of teeth of said wheel and that of the stationary wheel. This invention is applicable, with peculiar advantage, to the steering gear of vessels. J. F. Rochow of No. 16 Water street, Brooklyn, N. Y., is the inventor of this improvement, and he has secured his invention by patents in the United States and in England through the Scientific American Patent Agency.

**Skate Fastening.**—This invention relates to a new and improved mode of attaching the back part of the skate to the heel of the boot or shoe, and consists in having a hook at the back part of a heel plate attached to the skate, and a plate provided with two parallel slots attached to the heel of the boot or shoe, the parts being so arranged that the hook on the skate may be passed through the slots in the plate which is attached to the heel of the boot or shoe and a perfect lock obtained. David Maydole, of Norwich, N. Y., is the inventor of this improvement.

**Refining Lard.**—The object of this invention is to reduce the temperature of lard as the same passes from the heating pan to the cooling vat, to such a degree that it requires but little stirring to bring it to the desired consistency. The invention consists in the application or use in an apparatus for refining lard, of a worm inclosed in a cask or tub, which can be wholly or partially filled with cold water; said worm being connected at one end to a pipe emanating from the bottom of the heating pan and at the other end to a spout discharging into the cooling vat in such a manner that the lard, in passing from the heating pan to the cooling vat, is cooled down to such a degree that very little stirring in the cooling pan is needed to bring the lard to the desired consistency fit to be packed in suitable tubs, barrels or other vessels; the invention consists also in the arrangement of a regulating cock inserted into a pipe leading from the bottom of the cask which contains the worm, to the waste-water or over-flow pipe in combination with the water-supply pipe and with the heating pan in such a manner that by opening or closing said cock the quantity of water in the cask and with it the temperature of the lard passing through the worm can be regulated, keeping the same at such a degree of heat that it flows freely from the worm without stopping up its own passage, and at the same time the temperature is reduced so that it requires but very little stirring to bring the lard to the desired consistency. Wm. J. Wilcox, of New York city, is the inventor of this device.

**Elongated Bullets.**—This invention consists in the combination with an elongated expanding bullet of a headed pin and a conical expanding disk, the disk having its concave side against the base of the bullet, and the pin entering the cavity thereof, and operating to produce the flattening of the disk, by which it is caused to expand against the walls of the gun and enter the rifle grooves thereof. It also consist in so fitting the pin to the cavity of the bullet to produce the expansion of the cylindrical portion of the exterior thereof that the forward part of the said portion shall be first expanded, thus causing the friction against the bore of the gun to begin as far forward as the bullet shall bear against the bore, by

which means the bullet will be more quickly and perfectly upset, its friction more evenly distributed and its center of gravity more nearly to coincide with the center of the bore of the gun—all conditions necessary to accuracy. Elijah D. Williams, of Philadelphia, Pa., is the inventor of this improvement.

**Blasting Compound.**—This invention relates to the blasting compound for which the same inventors obtained Letters Patent No. 34,654, dated March 11, 1862. The principal object of this improvement is to prevent the separation of the sulphur from the bark or any other woody or carbonaceous matter that may be used as a substitute therefor, and to this end it consists in the addition to the compound of bark or other woody or carbonaceous matter, nitrate of soda, sulphur and chlorate of potash, of a suitable quantity of starch to prevent such separation. W. R. Thomas and Morgan Emanuel, Jr., of Catsauqua, Pa., are the inventors of this blasting compound.

## THE BATTLE OF FREDERICKSBURG.

Our readers are doubtless familiar with the history of the conflict of the 14th of December, from the reports in the daily papers, and know, ere this reaches them, that another disaster has been visited upon us. Oh that we might write, instead, that victory had perched upon our helmets! The bitter almost insupportable shame of the "accident" is heightened by the stinging, though unintended, sarcasms conveyed through paragraphs in the daily journals. As, for instance, "the rebels are starving," "the rebels are ragged, without powder, ball, or caissons for their guns;" in short, that Falstaff's ragged regiment was the National Guard in comparison to them—the poor, wretched, deluded beings! What are such comments as these worth but to fasten deeper in our sides the thorn of disgrace and shame? Is the country really degenerate? Is the spirit which of old hurled back our foes from these shores and from these mountains and hills—which God never intended to be other than free—quenched and dead? No! a thousand times no! The blood that shed itself in vain, in fronting the quivering lines of certain death that flashed demoniacally before the eyes of those heroes who crossed the Rappahannock in open boats to dislodge the rebel sharpshooters, is the type of that fire which blazed of old against those who sought to overthrow the liberties we love. Of what use are the sacred dead who lie scattered through thousands of miles over this broad, and once fair land? Tell us who it is—for it is not the rank and file—who delay the consummation of our victories and the restoration of the peaceful arts; what clue to this worse than Cretan labyrinth do the telegrams Fitz-John Porter forwarded to McClellan afford, as quoted by the *New York Tribune* of the 18th of December last? What a spectacle do they present of jealousy, hate and contemptible rivalry, through which means the nation was disgraced and a good soldier degraded in the last battle at Manassas.

Alas! for America when she fell from the hands of honest patriots into those of politicians; when party strife and party weal or woe obtained the reins of power. Not Jehu when he drove the car of Phœbus, and threw the chariot of the sun out of its accustomed course, wreaked half such confusion upon the nether world as exists at this moment among us politically. Oh! if the dead who lie calmly sleeping in their graves upon the bleak hillsides could speak from their narrow houses, what reproaches would they utter against those whose folly, and want of fitness for their places, had brought them thus low. The sire, the man of mature age, youth, infancy even, in one common grave, the bosom of our loved country, sleep calmly forever. Is it strange then, in view of recent events, that we stand to-day with our currency depreciated, and our taxes threatening to overwhelm us, the wonder and contempt of the pettiest nations of the earth? We have not degenerated! In proof of this assertion see the records of the rank and file, how glorious it is! There is no necessity for pricking them into the fight at the point of the sword. The Eighty-eighth Pennsylvania built a pontoon bridge across the river, and would have crossed, or did cross to the enemy in spite of the dangers which threatened them; what a glory should this be, to the old Keystone State; and a little child ten years of age crossed in the first boat with the noble 400 of the

Seventh Michigan, who first advanced on Fredericksburg, and beat his little note of defiance in the face of the foe. Such actions as these almost redeem the disgrace which has fallen upon us. Thirteen thousand five hundred of our bravest men are placed *hors-du-combat*, and for naught; what a holocaust! Men are thrown forward and face blazing batteries on which they are piled like fagotwood, and when the action is found useless, they retire and re-cross the river, as we are gravely told, without loss. What of those who never re-crossed the river, and who lie stark and stiff upon the whitened and frosty fields, an awful reproach to their leaders' want of prudence and consideration for them? With what heavy hearts we read the now stale old repetition, that the rebels are starved and ragged and disheartened. Yes, so they may be, but they slay a whole town in a few hours and still present an unbroken front. There is no use in hiding or higgling over facts; there is no earthly benefit to be derived from representing disasters as victories, or palming off defeats as creditable skirmishes. And those who telegraph such things from the battle-fields forget that this is an age in which truth, apart from them, far outstrips the lightning. We have never faltered in our allegiance to the Government, or been wanting in the most implicit faith in its ability, but when we view such "feats of arms" as the one which we record, not in anger but in grief, we cannot but feel anxious for the future. God grant that the turning point be not far distant!

## VALUABLE RECEIPTS.

**WATER-PROOF POROUS CLOTH.**—Several inquiries have been made of us, lately, respecting the mode of preparing cloth to render it water-proof and yet maintain its porosity. Close water-proof cloth fabrics, such as glazed oil-cloth, india-rubber, and gutta-percha cloth are completely water-proof, but do not permit perspiration and the exhaled gases from the skin to pass through them, because they are air-tight as well as water-tight. Persons who wear air-tight garments soon become faint, if they are undergoing severe exercise, such as that to which soldiers are exposed when on march. A porous water-proof cloth, therefore, is the best for outer garments during wet weather, for those whose duties or labor cause them to perspire freely. The best way for preparing such cloth is by the process adopted for the tunics of the French soldiers, during the Crimean war. It is as follows:—Take 2½ lbs. of alum and dissolve this in 10 gallons of boiling water; then in a separate vessel dissolve the same quantity of sugar of lead in 10 gallons of water, and mix the two solutions. The cloth is now well handled in this liquid until every part of it is penetrated; then it is squeezed and dried in the air or in a warm apartment, then washed in cold water and dried again, when it is fit for use. If necessary, the cloth may be dipped in the liquid and dried twice before being washed. The liquor appears curdled, when the alum and lead solutions are mixed together. This is the result of double decomposition, the sulphate of lead which is an insoluble salt being formed. The sulphate of lead is taken up in the pores of the cloth, and it is unaffected by rains, or moisture, and yet it does not render the cloth air-tight. Such cloth is also partially non-inflammable. A solution of alum, itself, will render cloth, prepared as described, partially water-proof, but it is not so good as the sulphate of lead. Such cloth—cotton or woolen—sheds rain like the feathers on the back of a duck.

**COMPOSITION FOR LEATHER.**—In the receipt given on page 362 of the present volume of the *SCIENTIFIC AMERICAN*, there is an important typographical omission. The proper quantity of tallow is not given. The receipt should be as follows:—One pound of fresh tallow, one ounce of yellow bees-wax and one eighth of an ounce of shell-lac in powder. We have used this article and can vouch for its good quality.

The series of useful receipts will be continued in next volume.

**MESSRS. JONES AND QUIGGIN**, of Liverpool, will shortly launch a steamer of 250 tons burthen, built of steel plates only  $\frac{3}{16}$ ths of an inch in thickness. The *Liverpool Journal of Commerce* states that she is intended for a "peculiar trade," and that she will steam 20 knots an hour. This "peculiar trade" is no doubt Confederate smuggling.